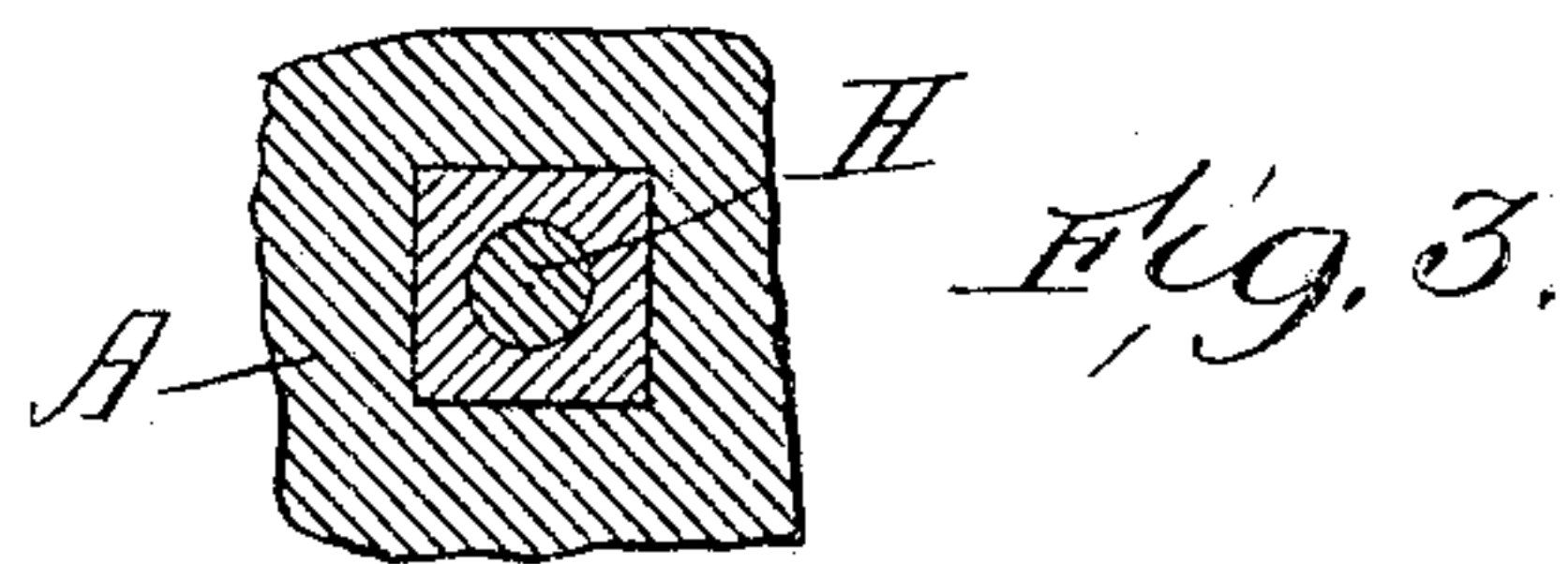
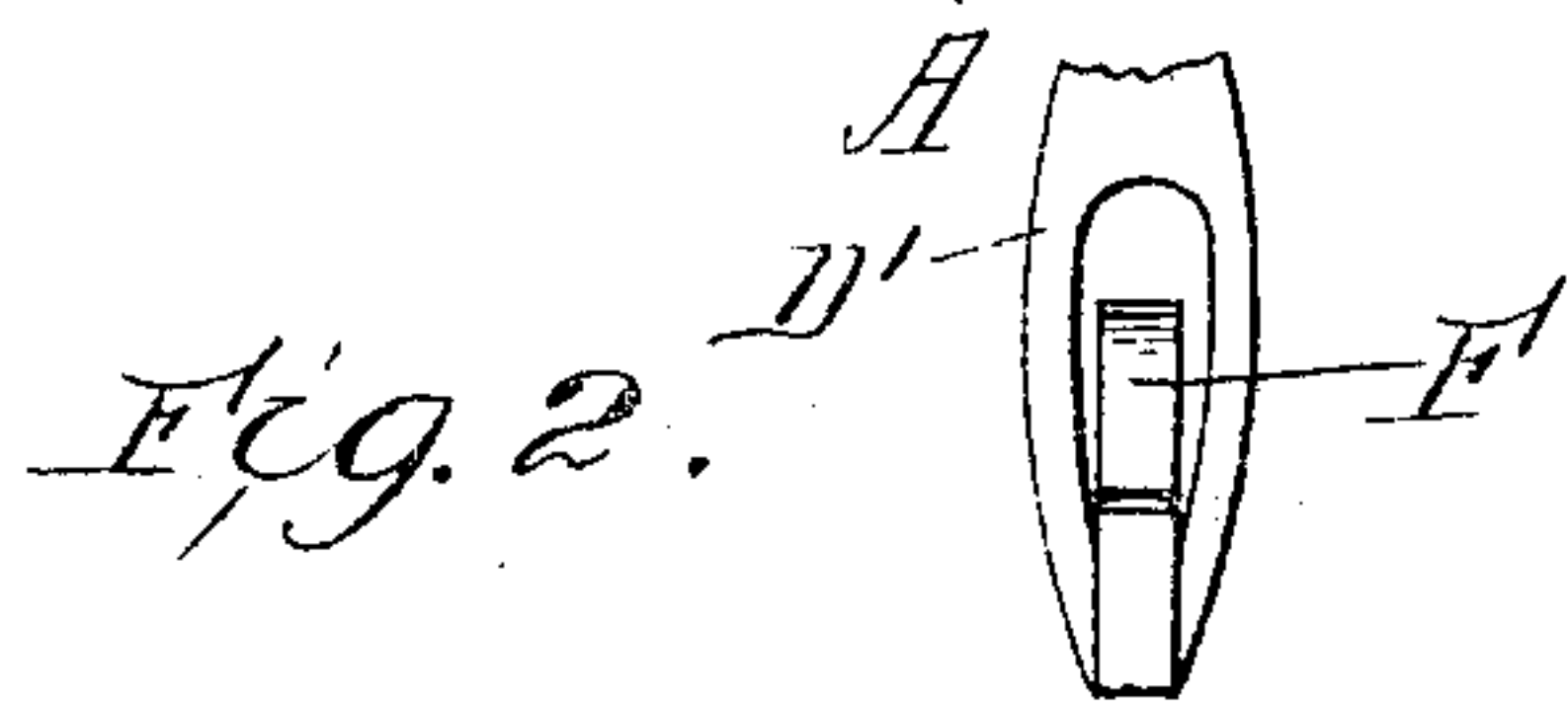
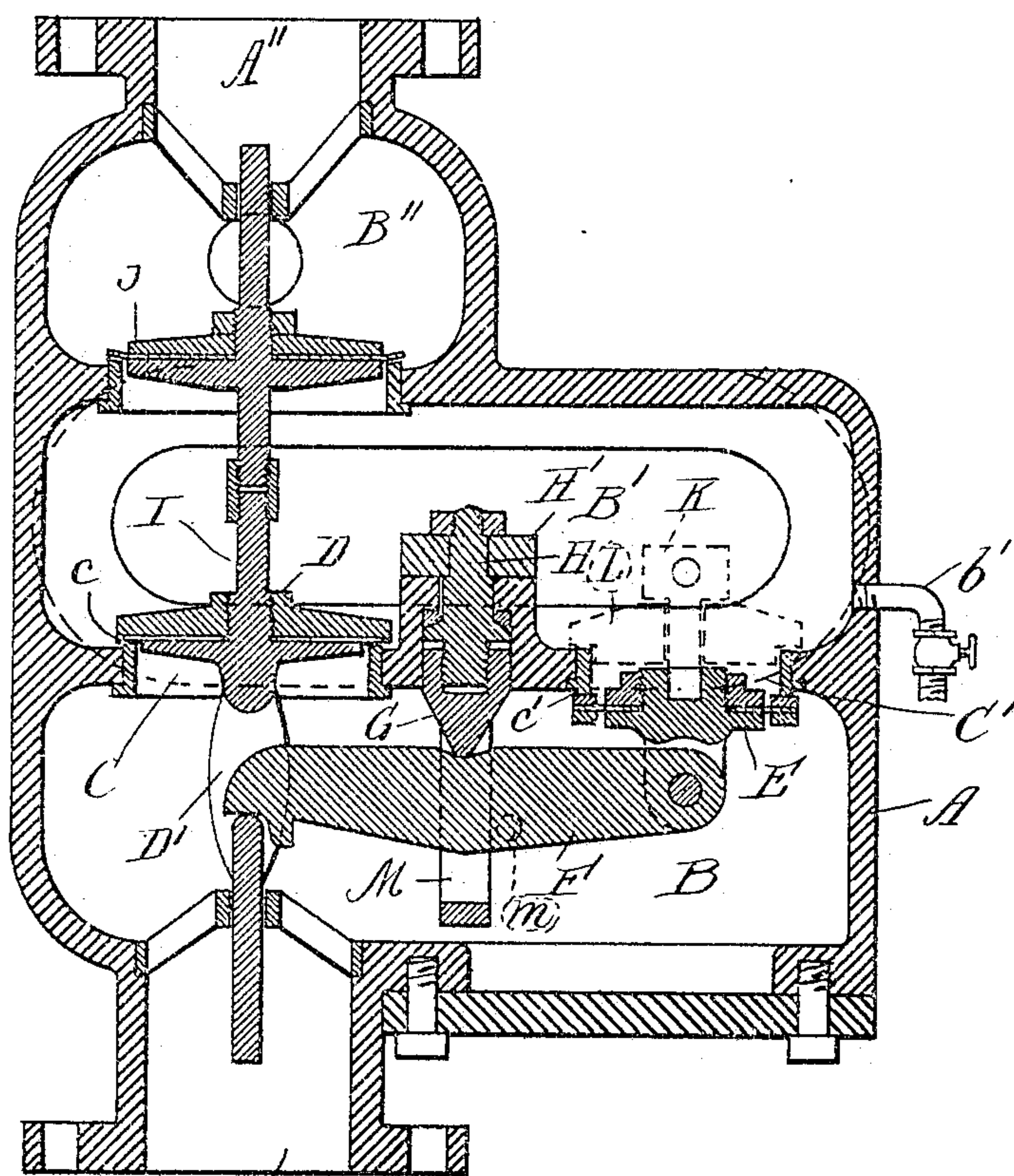


No. 788,061.

PATENTED APR. 25, 1905.

E. G. PATTEE.  
VALVE FOR AUTOMATIC FIRE EXTINGUISHERS.  
APPLICATION FILED FEB. 6, 1904.

*Fig. 1*



Witnesses:  
Ray White.  
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E. G. Pattee  
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# UNITED STATES PATENT OFFICE.

EDWIN G. PATTEE, OF CHICAGO, ILLINOIS.

## VALVE FOR AUTOMATIC FIRE-EXTINGUISHERS.

SPECIFICATION forming part of Letters Patent No. 788,061, dated April 25, 1905.

Application filed February 6, 1904. Serial No. 192,399.

*To all whom it may concern:*

Be it known that I, EDWIN G. PATTEE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Valves for Automatic Fire-Extinguishers, of which the following is a specification.

The present invention relates to what is known as the main valve of a dry-pipe automatic fire-extinguishing system.

My object is to provide an improved valve of this type; and to this end the invention consists in the features of novelty that are hereinafter described with reference to the accompanying drawings, which are made a part hereof, and in which—

Figure 1 is a vertical section of a valve embodying the invention. Figs. 2 and 3 are details.

The casing A is provided with an inlet A', adapted for communication with the street-main or other source of water-supply, and an outlet A'', adapted for communication with the riser of the system. The casing has also a chamber B, which is in constant open communication with the water-supply, a chamber B', hereinafter called the "low-pressure" chamber, and a chamber B'', which is in constant open communication with the riser of the system.

The chamber B' is maintained at low or atmospheric pressure through the medium of a valved drain b' of customary construction. It communicates with the chamber B through the medium of two ports C and C', which are surrounded by valve-seats c and c', respectively, the former of which is presented upward and the latter downward.

D and E are valves adapted to these seats. The former seats against and the latter seats with the water-pressure, and their areas exposed to the water-pressure are differential, with a slight excess in favor of the valve D, so that by reason of an interposed lever F the one has a counterbalancing effect upon the other, which tends to eliminate the injurious effect of water-hammer. At one end the lever is jointed to ears projecting downward from the valve E; but at its other end

it simply bears downward upon a yoke D', depending from the valve D; but these details are immaterial. At about its mid-length the lever bears upward against a fulcrum G, which is adjustable for the purpose of properly setting the valves. This fulcrum consists of a block having a non-circular portion occupying a socket of corresponding shape in the web or diaphragm that separates the chambers B and B'. This block has a threaded cavity or socket for receiving the correspondingly-threaded lower end of an adjusting-screw H, which is suitably seated against the said diaphragm and provided with a fluted or other non-circular head H' for the reception of a wrench for turning it. By this means the valves D and E may be accurately seated, and this, as well as compensation for inequalities in expansion and contraction, is aided by making one of the valves flexible or with a yielding seating-surface. This may be done by constructing it of a central disk, a surrounding-ring adapted for contact with the seat, and an intervening annular diaphragm of flexible material, preferably thin sheet-steel.

The areas of the valves D and E that are exposed to the pressure of the water being nearly equal and the two arms of the intervening lever being practically equal, it is manifest that, saving the differential, the water-pressure will have no tendency to unseat the valves. In other words, they are nearly balanced one against the other. It therefore follows that water-hammer will not affect them, excepting to the extent of the differentials of their respective areas or to the mechanical advantage which one may have over the other due to the length of the respective arms of the lever. It therefore follows that to hold them seated the air-pressure in the system has but to overcome this difference, which it is readily able to do. To this end the valve D is connected by a rigid stem I (preferably) made in two parts threaded and connected by a sleeve, with a valve or cut-off J, which controls communication between the low-pressure chamber B' and the system. As shown, this valve has a flexible margin j, which contacts with its seat, and



this compensates for inequalities in expansion and contraction and for inaccuracies in the construction and adjustment of the parts. Furthermore, this valve is shown as having a  
 5 larger area exposed to the pressure of the air in the system than either of the valves D or E has exposed to the water-pressure; but this is not material, because it is manifest that the valves D and E being practically  
 10 balanced one against the other with only a slight preponderance in favor of their unseating it is only necessary that the pressure upon the valve J be sufficient to overcome this preponderance.

15 While setting the valve the cut-off E is held up by a bolt K, which passes through a disk L, that spans the port C'. The bolt and disk are located in the low-pressure chamber B' and are accessible through a hand-  
 20 hole thereof. In the drawings they are dotted.

It will be observed that when the valve is set and the temporary support K L removed there is nothing tending to hold up the lever and the valve E excepting the upward pres-  
 25 sure of the water against the latter. In other words, the lever is free to fall away from its fulcrum and carry with it the valve E. When the valve has fallen to the bot-  
 30 tom of the chamber B, the water has no tendency to lift and reseal it, and hence it is impossible for the valve to become columned.

For guiding the lever in its fall a slotted yoke M is provided, and for preventing its  
 35 endwise movement a stud m is arranged on the side of the lever and adapted to contact with the yoke.

The characteristic feature of the present invention is that the valves are automatic-  
 40 ally unseated by the pressure of the water in the main or supply pipe upon a predetermined reduction of the air-pressure in the system. It does not belong to that class of valves in which the water-pressure in the  
 45 main or supply pipe positively holds the water-valves closed and in which the water-valves are opened in opposition to the water-pressure by the air-pressure in the system acting through the medium of some multi-  
 50 plying mechanism. The water-valves, as before intimated, are differential and the excess, which is only slight, is in favor of the valve which seats against the water-pressure, so that the instant all other forces tending to hold the valves closed are removed this ex-  
 55 cess will cause or allow the valves to open.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a device of the class described, the combination with a casing having a chamber  
 60 and provided with two ports opening thereinto for the admission of water and a port opening therefrom for the escape of water to the system, of two valves for controlling the water-inlet ports, one of said valves seating  
 65 with the other against the water-pressure,

intervening mechanism whereby the valves oppose each other with a counterbalancing effect, the preponderance of water-pressure being in favor of the valve seating against the water-pressure, and means controlled by  
 70 the pressure in the system for overcoming said preponderance and holding the valves normally seated, whereby when the pressure in the system is reduced the pressure of the water will automatically unseat said valves,  
 75 substantially as described.

2. In a device of the class described, the combination with a casing having a chamber and provided with two ports opening there-  
 80 into for the admission of water and a port opening therefrom for the escape of the water to the system, of two differential valves for controlling the water-inlet ports, one of said valves seating with and the other against the water-pressure and the preponderance of  
 85 the differential being in favor of the valve seating against the water-pressure, intervening mechanism through the medium of which said valves oppose each other with a counterbalancing effect, and means controlled by  
 90 the pressure in the system for overcoming said preponderance and holding the valves normally seated, whereby when the pressure in the system is reduced the pressure of the water will automatically unseat said valves,  
 95 substantially as described.

3. In a device of the class described, the combination with a casing having a chamber and provided with two ports opening there-  
 100 into for the admission of water and a port opening therefrom for the escape of water to the system, of two valves for controlling the water-inlet ports, one of said valves seating with and the other against the water-pres-  
 105 sure, said ports and valves being disposed side by side and out of axial alinement with each other, a lever, fulcrumed between the two valves, through the medium of which they oppose each other with a counterbalancing effect, and means controlled by the  
 110 pressure in the system for holding the valves seated in opposition to the preponderance of water-pressure against them, said preponderance being in favor of the valve seating against the water-pressure whereby upon a  
 115 reduction of the pressure in the system the water-pressure will automatically unseat the valves, substantially as described.

4. In a device of the class described, the combination of a casing having a low-pres-  
 120 sure chamber and provided with two ports opening thereinto for the admission of water and a port opening therefrom for the escape of water to the system, of two valves for controlling the water-inlet ports, one of said  
 125 valves seating with and the other against the water-pressure, intervening mechanism through the medium of which said valves oppose each other with a counterbalancing effect, an air-valve for controlling the port-  
 130



opening to the system, and means for transmitting pressure from said air-valve to the water-valves for holding them seated in opposition to the preponderance of water-pressure against them, said preponderance being in favor of the valve seating against the water-pressure, substantially as described.

5. In a device of the class described, the combination with a casing having a water-chamber, a low-pressure chamber communicating with the water-chamber through two ports, and an air-chamber communicating with the low-pressure chamber through a port, of differential valves, one seating with the water-pressure, the other seating against the water-pressure, the preponderance of the differential being in favor of the valve seating against the water-pressure, intervening mechanism through the medium of which said valves oppose each other with a counterbalancing effect, a valve for controlling the

air-port aforesaid, and means for transmitting pressure from said air-valve to the water-valves whereby the preponderance of water-pressure is overcome, substantially as described.

6. In a device of the class described, the combination with a casing having two ports for the admission of water, and a pair of valves for controlling said ports, one of said valves seating with and the other against the water-pressure, of a lever for transmitting pressure from one of said valves to the other, so that each has a counterbalancing effect upon the other, and a fulcrum for the lever, the lever being free to fall away from its fulcrum and carry with it one of said valves, substantially as described.

EDWIN G. PATTEE.

Witnesses:

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